



**6712-01**

**FEDERAL COMMUNICATIONS COMMISSION**

**47 CFR Part 87**

**[WT Docket Nos. 10-61 and 09-42, RM-11503, RM-11596; FCC 13-30]**

**Aviation Services**

**AGENCY:** Federal Communications Commission.

**ACTION:** Final rule.

**SUMMARY:** In this document, the Federal Communications Commission (Commission) amends its rules to authorize the use of frequency 1090 MHz by aeronautical utility mobile stations for airport surface detection equipment, commonly referred to as vehicle “squitters,” to help reduce collisions between aircraft and airport ground vehicles. In addition, we establish service rules for audio visual warning systems to help aircraft in flight avoid antenna structures and other obstacles. We also adopt rules to permit ground testing of aviation data link systems, and decline to authorize remote monitoring of certain automated ground stations.

**DATES:** Effective [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER.] The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register as of [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER.]

**FOR FURTHER INFORMATION CONTACT:** Tim Maguire, Mobility Division, Wireless Telecommunications Bureau at (202) 418-2155.

**SUPPLEMENTARY INFORMATION:** This is a summary of the Commission's Report and Order (R&O), in WT Docket No. 10-61; FCC 13-30, adopted February 28, 2013, and released March 1, 2013. The full text of this document is available for inspection and copying during normal business hours in the FCC Reference Center, 445 12th Street SW, Room CY-A257, Washington, DC 20554, or by downloading the text from the Commission's website at

[http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2013/db0301/FCC-13-30A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2013/db0301/FCC-13-30A1.pdf). The

complete text also may be purchased from the Commission's duplicating contractor, Best Copy and Printing, Inc., Portals II, 445 12th Street, SW, Suite CY-B402, Washington, DC 20554.

Alternative formats are available for people with disabilities (Braille, large print, electronic files, audio format), by sending an e-mail to <FCC504@fcc.gov> or calling the Consumer and Government Affairs Bureau at (202) 418-0530 (voice), (202) 418-0432 (TTY).

## **Background**

1. Air traffic controllers utilize airport surface detection equipment (ASDE-X) to manage the movement of aircraft on airport surfaces, but the current system does not allow the positive identification of ground vehicles such as snowplows and maintenance vehicles that routinely operate on the runway movement area. See 47 CFR 87.345. Unless the vehicle is visible from the control tower, air traffic controllers can determine only its location, but not the vehicle type or the operator. See NPRM, 25 FCC Rcd at 3356 para. 3. In response to growing concerns about airplanes colliding with or having to take evasive maneuvers to avoid vehicles on the airport surface, the Federal Aviation Administration (FAA) seeks to expand the use of ASDE-X to manage the movement of service vehicles as well as aircraft in the runway movement area.

2. The National Telecommunications and Information Administration (NTIA), supported by the FAA, filed a petition for rulemaking requesting that the Commission amend part 87 of the Commission's rules to allow use of frequency 1090 MHz for tracking of ground vehicle movements on the airport surface. See Petition for Rulemaking of the National Telecommunications and Information Administration (July 29, 2008). In the Notice of Proposed Rulemaking and Order (NPRM), the Commission noted that the frequency 1090 MHz is currently used for ASDE-X to manage the movement of aircraft on airport surfaces and for other things, such as the Traffic Alert and Collision Avoidance System (TCAS),<sup>1</sup> but tentatively concluded that

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<sup>1</sup> TCAS is an airborne warning system designed to avert mid-air collisions. See Review of part 87 of the Commission's Rules Concerning the Aviation Radio Service, Report and Order and Further Notice of

permitting use of the frequency by vehicle squitters would further the public interest. See NPRM, 25 FCC Rcd at 3356 paras. 6-7.

3. Accordingly, the Commission sought comment on proposed technical and service rules for vehicle squitters on frequency 1090 MHz. See NPRM, 25 FCC Rcd at 3357 paras. 9-14. The NPRM sought comment on whether the Commission should limit operation of vehicle squitters to the runway movement area to prevent use of the system for purposes other than vehicle and aircraft safety (such as tracking baggage carts). See NPRM, 25 FCC Rcd at 3357 paras. 12. The NPRM also tentatively agreed with NTIA's proposal that the Commission coordinate applications with the FAA through the Interdepartment Radio Advisory Committee (IRAC), and it sought comment on whether the Commission should require applicants to pre-coordinate with the relevant FAA Regional Office before filing an application with the Commission. See NPRM, 25 FCC Rcd at 3357 para. 13.

## **I. PROCEDURAL MATTERS**

### **A. Paperwork Reduction Act Analysis**

4. This document contains new or modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. Specifically, it requires prospective DLT station licensees to coordinate their applications with ASRI, the aeronautical enroute station licensee. It will be submitted to the Office of Management and Budget (OMB) for review under section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new or modified information collection

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Proposed Rule Making, WT Docket No. 01-289, 18 FCC Rcd 21432, 21467 n.265 (2003) (Part 87 Report and Order). In the Part 87 Report and Order, the Commission adopted a proposal to permit ground testing of TCAS on frequency 1090 MHz, and amended § 87.475(c)(2) of the rules, 47 CFR 87.475(c)(2), accordingly. See Part 87 Report and Order, 18 FCC Rcd at 21467 para. 74. When it amended § 87.475(c)(2) later in that proceeding, however, the Commission inadvertently removed the language authorizing ground testing of TCAS on 1090 MHz. See Review of Part 87 of the Commission's Rules Concerning the Aviation Radio Service, Second Report and Order and Second Further Notice of Proposed Rule Making, WT Docket No. 01-289, 21 FCC Rcd 11582, 11587-88 para. 6 (2006) (Part 87 Second Report and Order). In the NPRM in this proceeding, the Commission proposed to correct that error by amending § 87.475(c)(2) to restore the deleted language. See NPRM, 25 FCC Rcd at 3357 n.13. We now adopt the proposed correction.

requirements contained in this proceeding. In the present document, we have assessed the effects of requiring coordination of DLT applications with ASRI and find that this will avoid interference to safety-related aeronautical enroute communications without having a significant impact on small business concerns with fewer than 25 employees. Coordination with ASRI should not be more burdensome than coordination with the FAA, which is required for analogous RLT applications.

#### **B. Report to Congress**

5. The Commission will send a copy of the R&O to Congress and the Government Accountability Office pursuant to the Congressional Review Act, see 5 U.S.C. 801(a)(1)(A).

#### **C. Final Regulatory Flexibility Analysis**

6. As required by the Regulatory Flexibility Act of 1980, as amended (RFA), an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the NPRM in WT Docket Nos. 10-61 and 09-42; RM-11503 and RM-11596, at 75 FR 22352, April 28, 2010. The Commission sought written public comment on the proposals in the NPRM, including comment on the IRFA. This present Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.

#### Need for, and Objectives of, the Report and Order

7. The rules adopted in the R&O are intended to ensure that the Commission's part 87 rules governing the Aviation Radio Service remain up to date and continue to further the Commission's goals of accommodating new technologies, facilitating the efficient and effective use of the aeronautical spectrum, avoiding unnecessary regulation, and, above all, enhancing the safety of flight. Specifically, we amend part 87 of the Commission's rules to allow use of the frequency 1090 MHz by aeronautical utility mobile stations for airport surface detection equipment, commonly referred to as vehicle "squitters," to help reduce collisions between aircraft and airport ground vehicles. In addition, we establish service rules for audio visual warning systems to help aircraft in flight avoid antenna structures and other obstacles. We also adopt rules to permit ground testing of aviation data link test systems.

### Summary of Significant Issues Raised by Public Comments in Response to the IRFA

8. No comments were submitted specifically in response to the IRFAs.

Nonetheless, we have considered the potential economic impact on small entities of the rules discussed in the IRFAs, and we have considered alternatives that would reduce the potential economic impact on small entities of the rules enacted herein.

### Description and Estimate of the Number of Small Entities to Which Rules Will Apply

9. The RFA directs agencies to provide a description of, and, where feasible, an estimate of the number of small entities that may be affected by the rules adopted herein. The RFA defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.” In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act. A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).

10. Small businesses in the aviation and marine radio services use a marine very high frequency (VHF), medium frequency (MF), or high frequency (HF) radio, any type of emergency position indicating radio beacon (EPIRB) and/or radar, an aircraft radio, and/or any type of emergency locator transmitter (ELT). The Commission has not developed a definition of small entities specifically applicable to these small businesses. For purposes of this analysis, the Commission uses the SBA small business size standard for the category Wireless Telecommunications Carriers (except satellite),” which is 1,500 or fewer employees. Census data for 2007 shows that there were 1,383 firms in that category that operated for the entire year. Of those 1,383, 1,368 had fewer than 1,000 employees, and 15 firms had 1,000 or more employees. Thus under this category and the associated small business size standard, the majority of firms can be considered small.

11. Some of the rules adopted herein may also affect small businesses that manufacture aviation radio equipment. The Census Bureau does not have a category specific to aviation radio equipment manufacturers. The appropriate category is that for wireless communications equipment manufacturers. The Census Bureau defines this category as follows: “This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment. Examples of products made by these establishments are: transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment.” The SBA has developed a small business size standard for Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing, which is: all such firms having 750 or fewer employees. According to Census bureau data for 2007, there were a total of 939 firms in this category that operated that year. Of this total, 912 had fewer than 500 employees and 27 had 500 or more employees. Thus, under this size standard, the majority of firms can be considered small.

Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities

12. The rule changes adopted in the R&O require manufacturers to meet certain criteria and potential licensees to operate the equipment as prescribed in the Rules, including prior coordination with the FAA and ASRI. We believe the other final rules will have no significant effect on the compliance burdens of regulatees. The R&O requires data link test (DLT) system applicants to coordinate with the aeronautical enroute licensee for the frequencies on which the DLT applicant proposes to operate. This requirement affects small and large companies equally. The compliance requirement is no greater than the requirement to coordinate with the Federal Aviation Administration applications to operate analogous radionavigation land test system equipment, which the NPRM proposed to extend to DLT applicants.

Steps Taken to Minimize the Significant Economic Impact on Small Entities, and Significant Alternatives Considered

13. The RFA requires an agency to describe the steps it has taken to minimize the significant economic impact on small entities consistent with the stated objectives of applicable statutes, including a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule considered by the agency which affect the impact on small entities was rejected.

14. We believe that the R&O does not impose any significant additional reporting, recordkeeping, or other compliance requirements on small entities. The rules adopted in the R&O authorize new ground station technologies that will promote the overriding issue of aviation safety. No commenter identified any less burdensome alternatives that would be consistent with the item's objectives and the Commission's goals and responsibilities.

15. The Commission will send a copy of the R&O in WT Docket Nos. 10-61 and 09-42, including the Final Regulatory Flexibility Analysis, in a report to be sent to Congress pursuant to the Congressional Review Act. In addition, the Commission will send a copy of the R&O, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the SBA. A copy of the R&O and the Final Regulatory Flexibility Analysis (or summaries thereof) will also be published in the Federal Register.

List of Subjects for 47 CFR Part 87

Air transportation, Communications equipment, Incorporation by reference, Radio.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch,  
Secretary.

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR part 87 as follows:

## **PART 87 – AVIATION SERVICES**

1. The authority citation for part 87 continues to read as follows:

Authority: 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303, 307(e) unless otherwise noted. Interpret or apply 48 Stat. 1064-1068, 1081-1105, as amended; 47 U.S.C. 151-156, 301-609.

2. Section 87.5 is amended by adding the definitions “Aircraft data link system”, “Aircraft data link land test station” in alphabetical order, and revising the definition of “Surveillance radar station “ to read as follows:

### **§ 87.5 Definitions.**

\* \* \* \* \*

Aircraft data link system. A system used to provide data communications between the aircraft and ground personnel necessary for the safe, efficient and economic operation of the aircraft.

Aircraft data link land test station. A station which is used to test and calibrate aircraft data link system communications equipment.

\* \* \* \* \*

Surveillance radar station. A radionavigation land station in the aeronautical radionavigation service employing radar to detect the presence of aircraft within its range.

\* \* \* \* \*

3. Section 87.131 is amended by revising the entry in the table for “Aeronautical utility mobile” and adding an entry for “Aircraft data link land test” immediately afterward to read as follows:

### **§ 87.131 Power and emissions.**

\* \* \* \* \*



<b>Class of station</b>	<b>Frequency band/frequency</b>	<b>Authorized emission(s) <sup>9</sup></b>	<b>Maximum power <sup>1</sup></b>
* *	* *	* *	*
Aeronautical utility mobile	VHF 1090 MHz	A3E M1D	10 watts. 20 watts.
Aircraft data link land test	131.450 MHz, 131.550 MHz, 131.725 MHz, 131.825 MHz, 136.850 MHz  136.900 MHz, 136.925 MHz, 136.950 MHz, 136.975 MHz	A2D      G1D	100 microwatts.      100 microwatts.
* *	* *	* *	*

<sup>1</sup> The power is measured at the transmitter output terminals and the type of power is determined according to the emission designator as follows:

(i) Mean power (pY) for amplitude modulated emissions and transmitting both sidebands using unmodulated full carrier.

(ii) Peak envelope power (pX) for all emission designators other than those referred to in paragraph (i) of this note.

\* \* \* \*

<sup>9</sup> Excludes automatic link establishment.

\* \* \* \*

4. Amend § 87.133 by amending the table in paragraph (a) to add an entry to category (7) between “Aircraft earth station” and Radionavigation stations” to read as follows:

**§ 87.133 Frequency stability.**

(a) \* \* \*

Frequency band (lower limit exclusive, upper limit inclusive), and categories of stations	Tolerance <sup>1</sup>	Tolerance <sup>2</sup>
* * *	* *	* *
Aeronautical utility mobile stations on 1090 MHz	1000	1000
* * *	* *	* *

<sup>1</sup> This tolerance is the maximum permitted until January 1, 1990, for transmitters installed before January 2, 1985, and used at the same installation. Tolerance is indicated in parts in 10 <sup>6</sup> unless shown as Hertz (Hz).

<sup>2</sup> This tolerance is the maximum permitted after January 1, 1985 for new and replacement transmitters and to all transmitters after January 1, 1990. Tolerance is indicated in parts in 10 <sup>6</sup> unless shown as Hertz (Hz).

\* \* \* \* \*

5. Section 87.137 is amended by amending the table in paragraph (a) to add an entry between M1A and N0N to read as follows:

**§ 87.137 Types of emission.**

(a) \* \* \*

Class of emission	Emission designator	Authorized bandwidth (kilohertz)		
		Below 50 MHz	Above 50 MHz	Frequency

				deviation
**	**	*	*	*
M1D	14M0M1D	14.0	.....	.....
**	**	*	*	*

6. Amend § 87.171 by adding the entries AVW and DLT to the “Symbol and class of station” list in alphabetical order, and by moving the entry for FAU between the FAT and FAW entries to read as follows:

**§ 87.171 Class of station symbols.**

\* \* \* \* \*

AVW—Audio visual warning systems

\* \* \*

DLT—Aircraft data link land test

\* \* \* \*

7. In § 87.173 amend the table in paragraph (b) as follows:

- a. Revise the entries for 122.700 MHz, 122.725 MHz, 122.750 MHz, 122.800 MHz, 122.850 MHz, 122.900 MHz, 122.950 MHz, 122.975 MHz, 123.000 MHz, 123.025 MHz, 123.050 MHz, 123.075 MHz, 123.300 MHz, 123.500 MHz, 128.825 – 132.000 MHz, 136.500 MHz – 136.875 MHz, 136.900 MHz, 136.925 MHz, 136.950 MHz, 136.975 MHz and 1030.000 MHz as set forth below
- b. Add new entries for 131.450 MHz, 131.550 MHz, 131.725 MHz, 131.825 MHz, 136.850 MHz and 1090.000 MHz in numerical order as set forth below.

**§ 87.173 Frequencies.**

\* \* \* \* \*

(b) \* \* \*

Frequency or frequency band	Subpart	Class of station	Remarks
**	**	**	*
122.700 MHz	G,L,Q	MA, FAU, MOU, AVW	Unicom at airports with no control tower; Aeronautical utility stations.
122.725 MHz	G, L, Q	MA, FAU, MOU, AVW	Unicom at airports with no control tower; Aeronautical utility stations.
122.750 MHz	F, Q	MA2, AVW	Private fixed wing aircraft air-to-air communications.
**	**	**	*
122.800 MHz	G, L, Q	MA, FAU, MOU, AVW	Unicom at airports with no control tower; Aeronautical utility stations.
**	**	**	*
122.850 MHz	H, K, Q	MA, FAM, FAS, AVW	
**	**	**	*
122.900 MHz	F, H, L, M, Q	MA, FAR, FAM, MOU, AVW	
**	**	**	*
122.950 MHz	G, L, Q	MA, FAU, MOU, AVW	Unicom at airports with control tower; Aeronautical utility stations.
122.975 MHz	G, L, Q	MA, FAU, MOU, AVW	Unicom at airports with no control tower; Aeronautical utility stations.
123.000 MHz	G, L, Q	MA, FAU, MOU, AVW	Unicom at airports with no control tower; Aeronautical utility stations.

123.025 MHz	F, Q	MA2, AVW	Helicopter air-to-air communications; Air traffic control operations.
123.050 MHz	G, L, Q	MA, FAU, MOU, AVW	Unicom at airports with no control tower; Aeronautical utility stations.
123.075 MHz	G, L, Q	MA, FAU, MOU, AVW	Unicom at airports with no control tower; Aeronautical utility stations.
**	**	**	*
123.300 MHz	K, Q	MA, FAS, AVW	
**	**	**	*
123.500 MHz	K, Q	MA, FAS, AVW	
**	**	**	*
128.825–132.000 MHz	I	MA, FAE	Domestic VHF.
131.450 MHz	I	DLT	
131.550 MHz	I	DLT	
131.725 MHz	I	DLT	
131.825 MHz	I	DLT	
**	**	**	*
136.500–136.875 MHz	I	MA, FAE	Domestic VHF; 25 kHz channel spacing.
136.850 MHz	I	DLT	
136.900 MHz	I	MA, FAE, DLT	International and Domestic VHF.
136.925 MHz	I	MA, FAE, DLT	International and Domestic VHF.
136.950 MHz	I	MA, FAE, DLT	International and Domestic VHF.
136.975 MHz	I	MA, FAE, DLT	International and Domestic VHF.
**	**	**	*
1030.000 MHz	Q	RLT	

1090.000 MHz	L	MOU, RLT	Vehicle Squitter.
* *	* *	* *	*

8. In part 87, revise the heading to subpart I to read as follows:

Subpart I- Aeronautical Enroute Stations, Aeronautical Fixed Stations, and Aircraft Data Link Land Test Stations.

9. Add an undesignated center heading “AIRCRAFT DATA LINK LAND TEST STATIONS” after §87.279, in subpart I and add §§ 87.285 and 87.287 to subpart I to read as follows:

#### AIRCRAFT DATA LINK LAND TEST STATIONS

##### **§ 87.285 Scope of service.**

The frequencies indicated in § 87.287 of this chapter may be used to test aircraft data link systems on a secondary basis to other licensed stations. Equipment must be designed so that it will engage in data link exchange only with the aircraft whose identification has been programmed into the device, and must comply with the applicable specifications for VDL Mode 2 operation set forth in the ICAO “Manual on VHF Digital Link (VDL) Mode 2” First Edition-2001, and RTCA DO-281A,” Minimum Operational Performance Standards for Aircraft VDL Mode 2 Physical, Link and Network Layer”, November 8, 2005. These documents are incorporated by reference in accordance with 5 U.S.C. 552(a), and 1 CFR part 51 and approved by the Director of the Federal Register. The RTCA document is available and may be obtained from RTCA, Inc., 1828 L Street, NW, Suite 805, Washington, DC 20036 and by email to [info@rtca.org](mailto:info@rtca.org) or go to <http://RTCA.org>. The ICAO document is available and may be obtained from the ICAO, Customer Services Unit, 999 University Street, Montréal, Quebec H3C 5H7, Canada, by email to [icaohq@icao.int](mailto:icaohq@icao.int) or go to: <http://www.ICAO.int>. You may inspect a copy at the Federal Communications Commission, 445 12th Street, SW, Washington, DC 20554, or at the

National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to:

[http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

**§ 87.287 Frequencies.**

(a) The frequencies assignable to aircraft data link land test stations are 131.450 MHz, 131.550 MHz, 131.725 MHz, 131.825 MHz, 136.850 MHz, 136.900 MHz, 136.925 MHz, 136.950 MHz, and 136.975 MHz. Interstitial frequencies separated by 8.33 kilohertz from these frequencies may also be assigned.

(b) Before submitting an application for an aircraft data link land test station, an applicant must obtain written permission from the licensee of the aeronautical enroute stations serving the areas in which the aircraft data link land test station will operate on a co-channel basis. The Commission may request an applicant to provide documentation as to this fact.

10. Amend § 87.349 by adding paragraph (f) to read as follows:

**§ 87.349 Frequencies.**

\* \* \* \* \*

(f) The Commission will assign frequency 1090 MHz for use by aeronautical utility mobile stations for ground vehicle identification and collision avoidance after coordination with the FAA, subject to the following conditions:

(1) The applicant must notify the appropriate Regional Office of the FAA prior to submission to the Commission of an application for a new station or for modification of an existing station. Each application must include the FAA Regional Office notified and date of notification.

(2) Eligibility is restricted to airport operators holding an FAA Airport Operating Certificate, and other entities approved by the FAA on a case-by-case basis to use frequency 1090 MHz for use by aeronautical utility mobile stations for ground vehicle identification and collision avoidance;

(3) No more than two hundred 1090 MHz aeronautical utility mobile stations will be authorized at one airport;

(4) Licenses are limited to only those locations that are within the vicinity of an FAA ASDE-X multilateration system or ADS-B equipment, and/or where the primary purpose for seeking transmit authorization is to provide surface data to aircraft and air traffic control authorities.

(5) Message transmission rates are limited as indicated in the table below:

ADS-B Message	Rate When Moving	Rate When Stationary
Surface Position Message (Types 5, 6, 7, 8)	Every 0.4 to 0.6 seconds	Every 4.8 to 5.2 seconds
Aircraft Operational Status (Type 31)	Every 4.8 to 5.2 seconds	Every 4.8 to 5.2 seconds
Aircraft Identification and Type (Type 2)	Every 4.8 to 5.2 seconds	Every 9.8 to 10.2 seconds

11. Amend § 87.475 as follows:

- a. Redesignating paragraph (b)(9), (b)(7) and (8) as paragraphs (b)(7), (b)(8) and (9) respectively;
- b. Adding new paragraphs (b)(10) through (b)(14); and
- c. Revising paragraphs (c)(1) and (c)(2) introductory text .

**§ 87.475 Frequencies.**

\* \* \* \* \*

(b) \* \* \*

(10) 2700-2900 MHz: Non-Government land-based radars may be licensed. U.S.



Government coordination is required. Applicants must demonstrate a need for the service which the Government is not prepared to render.

(11) 5000-5250 MHz: This band is to be used for the operation of the international standard system (microwave landing system).

(12) 9000-9200 MHz: This band is available to land-based radars. Stations operating in this band may receive interference from stations operating in the radiolocation service.

(13) 15,400-15,700 MHz: This band is available for use of land stations associated with airborne electronic aids to air navigation.

(14) 24,250-25,250, 32,300-33,400 MHz: In these bands, land-based radionavigation aids are permitted where they operate with airborne radionavigation devices.

(c) Frequencies available for radionavigation land test stations. (1) The frequencies set forth in §§ 87.187(c), (e) through (j), (r), (t), and (ff); and 87.475(b)(6) through (b)(11) may be assigned to radionavigation land test stations for the testing of aircraft transmitting equipment that normally operate on these frequencies and for the testing of land-based receiving equipment that operate with airborne radionavigation equipment.

(2) The frequencies available for assignment to radionavigation land test stations for the testing of airborne receiving equipment are 108.000 and 108.050 MHz for VHF omni-range; 108.100 and 108.150 MHz for localizer; 334.550 and 334.700 MHz for glide slope; 978 and 979 MHz (X channel)/1104 MHz (Y channel) for DME; 978 MHz for Universal Access Transceiver; 1030 MHz for air traffic control radar beacon transponders; 1090 MHz for Traffic Alert and Collision Avoidance Systems (TCAS); and 5031.0 MHz for microwave landing systems. Additionally, the frequencies in paragraph (b) of this section may be assigned to radionavigation land test stations after coordination with the FAA. The following conditions apply:

\* \* \* \* \*

12. Section 87.483 is added to subpart Q to read as follows:

**§ 87.483 Audio visual warning systems.**

An audio visual warning system (AVWS) is a radar-based obstacle avoidance system. AVWS activates obstruction lighting and transmits VHF audible warnings to alert pilots of potential collisions with land-based obstructions. The AVWS operations are limited to locations where natural and man-made obstructions exist. The continuously operating radar calculates the location, direction and groundspeed of nearby aircraft that enter one of two warning zones reasonably established by the licensee. As aircraft enter the first warning zone, the AVWS activates obstruction lighting. If the aircraft continues toward the obstacle and enters the second warning zone, the VHF radio transmits an audible warning describing the obstacle.

(a) Radiodetermination (radar) frequencies. Frequencies authorized under § 87.475(b)(8) of this chapter are available for use by an AVWS. The frequency coordination requirements in § 87.475(a) of this chapter apply.

(b) VHF audible warning frequencies. Frequencies authorized under § 87.187(j), § 87.217(a), § 87.241(b), and § 87.323(b) (excluding 121.950 MHz) of this chapter are available for use by an AVWS. Multiple frequencies may be authorized for an individual station, depending on need and the use of frequencies assigned in the vicinity of a proposed AVWS facility. Use of these frequencies is subject to the following limitations:

- (1) The output power shall not exceed -3 dBm watts for each frequency authorized.
- (2) The antenna used in transmitting the audible warnings must be omnidirectional with a maximum gain equal to or lower than a half-wave centerfed dipole above 30 degrees elevation, and a maximum gain of +5 dBi from horizontal up to 30 degrees elevation.

(3) The audible warning shall not exceed two seconds in duration. No more than six audible warnings may be transmitted in a single transmit cycle, which shall not exceed 12 seconds in duration. An interval of at least twenty seconds must occur between transmit cycles.

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